CRES®
CENTER FOR REPRODUCTION OF ENDANGERED SPECIES

REPORT
SPRING 1995

Unlimited Possibilities: Celebrating 20 Years of CRES, 1975-1995

Where do zoo professionals turn when they need to determine the sex of a bird or a reptile? What can be done if a mysterious virus attacks hoofed stock? How can curators and keepers successfully manage a cheetah population of "fussy" breeders? Why won't the dik-dik colony produce offspring? And why are Darwin's rheas hatching deformed chicks?

Just 25 years ago, these questions could not be answered by zoo veterinarians and curators: the basic biology of most species was still unknown. While zoos have existed for centuries, research departments associated with zoos are relatively new. But, as zoos began to focus on successfully breeding endangered species and managing healthy and self-sustaining populations, questions of animal diseases and solutions to reproductive problems were raised.

At the San Diego Zoo, a hospital was built in 1926, funded by Ellen Browning Scripps, for the treatment of animals and for related studies. This was in answer to San Diego Zoo founder and physician Dr. Harry Wegeforth's great wish for a place where medical personnel could study comparative medicine between humans and animals. However, a well-defined research department—one that focused on animals and their health and not on animals as models for human medical problems—did not exist at the Zoo until nearly half a century later.

The Center for Reproduction of Endangered Species (CRES) owes its beginnings to the farsighted planning and unflagging energy of the late Dr. Charles Schroeder, the Zoo's director from 1954 to 1972; to Dr. Kurt Benirschke, a physician who conducted pioneering work in human twinning and was Professor of Pathology and Reproductive Medicine at the University of California, San Diego; to Charles Bieler, who became Zoo director in 1973; and to the Society's board of trustees, who approved the vision for CRES.

It was the Zoological Society's good fortune that Dr. Benirschke, who became the first CRES director in 1975, already had associations with zoos when he came to UCSD in the early 1970s. His remarkable

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One of the first CRES projects involved learning how to sex Darwin's rheas.

CRES® is operated by the Zoological Society of San Diego.

Is This the Year?
Northern white rhinos receive a "hormonal jumpstart" for 1995. See page 3.

Adopt a Bear!
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The Zoo receives its import permit. See page 4.

Unlimited Possibilities: Celebrating 20 Years of CRES, 1975-1995

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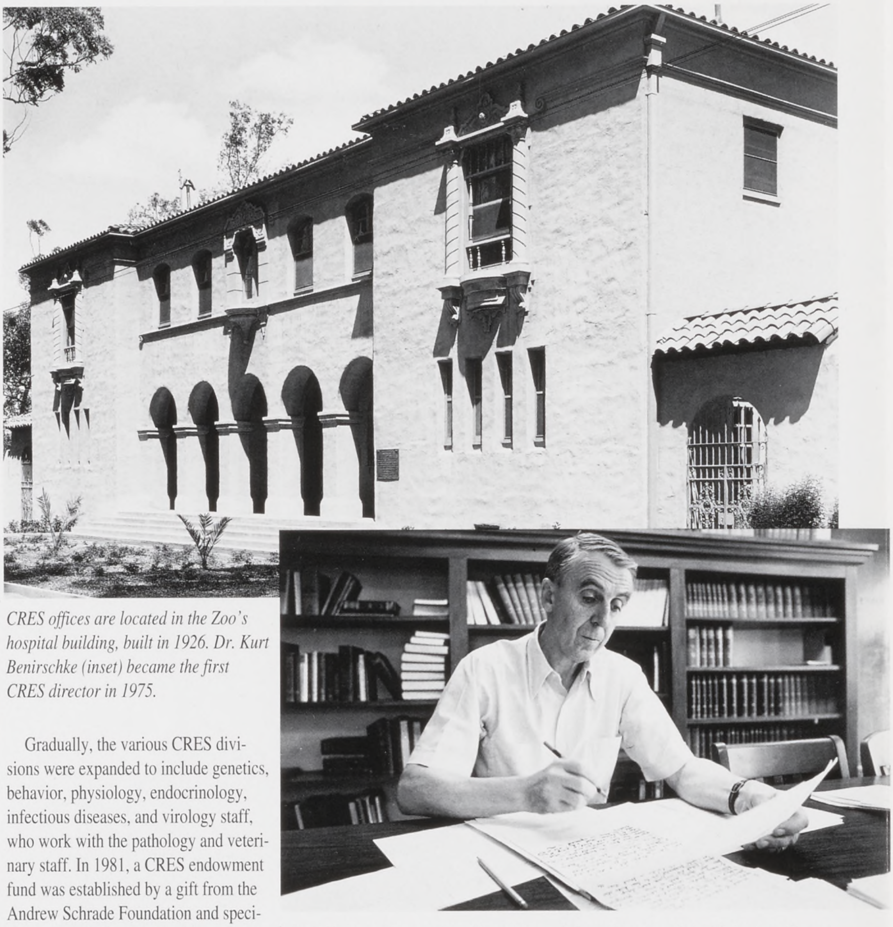
career of investigation into human and animal cytogenetics led to his solution of a reproductive puzzle: the sterility of mules. Through chromosomal studies, he demonstrated the basis of infertility in mules. While collecting material for a chromosome atlas, he obtained tissue samples from most major United States zoos. And when he came to UCSD as a professor, his association with the San Diego Zoo naturally followed. He was soon appointed chairman of the Society's research and animal reproduction committee.

From the beginning, the approach at CRES illustrated the unlimited possibilities of a concentrated research program within a zoo.

Dr. Benirschke's involvement with comparative research between humans and animals stimulated his studies. Consequently, he led the committee in preparing a white paper that described the need for in-house research at the Zoo. This was urgently needed to further investigation of the many problems of breeding endangered species and sustaining their populations in captivity. Today, CRES is world renowned for its excellence in its multidisciplinary approach, as well as the application of human medical technology and modern research methods for the preservation of threatened species.

One project established over several years and brought to the Zoo by Dr. Benirschke became a cornerstone of CRES: a large cell bank, maintained at sub-zero temperatures, soon dubbed the "Frozen Zoo." CRES scientists have now cataloged cells and frozen sperm and embryos from more than 350 species. This continues to be an incredibly valuable resource for in-house research and is in demand by researchers worldwide.



CRES offices are located in the Zoo's hospital building, built in 1926. Dr. Kurt Benirschke (inset) became the first CRES director in 1975.

Gradually, the various CRES divisions were expanded to include genetics, behavior, physiology, endocrinology, infectious diseases, and virology staff, who work with the pathology and veterinary staff. In 1981, a CRES endowment fund was established by a gift from the Andrew Schrade Foundation and specified to benefit the animals. The endowment has grown with income from such programs as Kicks for Critters—begun in 1980 by Rolf Benirschke, Dr. Benirschke's son and former placekicker for the Chargers—which endowed the Benirschke Chair; the Caesar Kleberg Foundation, which funded the Kleberg Chair in Genetics; and the J. Dallas Clark Postdoctoral Fellowship in Behavior, as well as other private donations. The Society's goal is to increase the endowment to a sum large enough to provide an annual income that could fully fund CRES and assure its continuation.

Over the past 20 years, the in-house research at CRES has extended to more than 36 outreach programs all over the world. These studies benefit animals in captivity, those in the wild, and, where possible, assist in the reintroduction of captive-bred animals to the wild and preservation of habitat itself.

As Dr. Benirschke points out, one of the early problems brought to his attention was by the late K.C. Lint, curator of birds at the Zoo, who said "You've got to help me with the birds. I have all these problems with the Darwin's rheas." There was an incredibly high mortality rate and deformed chicks were being hatched. Furthermore, it was impossible to sex the birds visually: breeding was a hit-and-miss affair. As Dr. Benirschke explains, "Nobody knew how to tell the birds apart. So we started basic research on sexing birds and then reptiles. The method we discovered to determine sex from blood samples was soon modified to allow use of noninvasive specimens (such as feces). This technique is still being used today. We would not have been able to save the California condors if we could not determine their sex."

From the beginning, the approach at CRES illustrated the unlimited possibilities of a concentrated research program within a zoo. This is an effort with worldwide implications: the expertise and technology do exist to forestall the tragic extinction of our wildlife.
—Editor

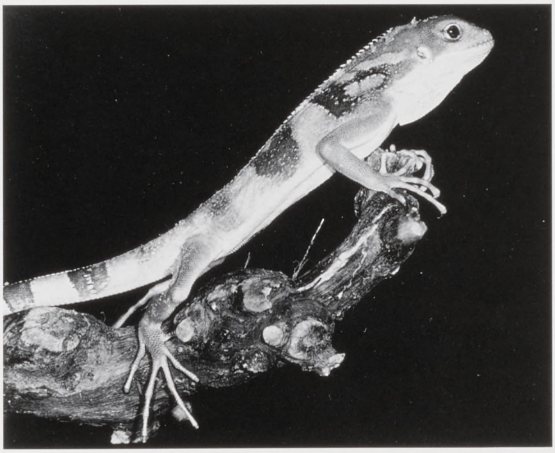
INSIDE CRES

Reproductive Physiology

Significant progress has been made in the Society's efforts to breed the northern white rhinoceros. This severely endangered species numbers less than 50 individuals worldwide, with only 10 in captivity. Unfortunately, captive reproduction of this magnificent species has been extremely difficult. Because of our success breeding the southern white rhino, with more than 100 births, the San Diego Wild Animal Park was given four northern whites (two males and two females) as the nucleus of a breeding herd. Neither of the 21-year-old females had ever exhibited estrous behavior, and preliminary fecal steroid analysis did not reveal fluctuations of estrogens or progestins indicative of cyclicity. Both females, Nola and Nadi, were given a series of hormone treatments devised by Dr. Barbara Durrant of the CRES reproductive physiology division to mimic the normal estrous cycle of a rhinoceros. Following this "hormonal jumpstart," both females began to cycle on their own. Ultrasound examination of the ovaries of each female confirms that ovulation is occurring, and there have been behavioral signs of estrus. We are optimistic that breeding will occur in 1995 for this critically endangered species.

Comparative Physiology

Chemical and visual signals play an integral role in maintaining social systems among lizards. Communication in many species is characterized by elaborate head and body displays that establish dominance, define territories, and facilitate courtship and reproduction. Fiji Island banded iguanas, which have well-developed scent glands and are noted for their striking colors and complex displays, probably rely extensively on both types of signals. In collaboration with the San Diego Zoo's reptile department, Dr. Allison Alberts, CRES comparative physiologist, and Jeff Lemm, research assistant, have initiated studies to determine the types of information communicated through visual and chemical signals in this species. They are investigating the distance over which signals function, as well as how exposure to different types of signals influences reproductive success, and the spatial distribution of males and females in the environment. Banded iguanas are endangered, primarily because they inhabit fragile island ecosystems. The Zoological Society maintains a longstanding commitment to the conservation of banded iguanas through its highly successful captive propagation program. These new studies represent an excellent opportunity to strengthen and broaden our involvement with this unique species. Research on the behavioral mechanisms controlling individual spacing patterns and reproductive processes will be important not only in designing management protocols that promote successful reproduction in zoos but also for determining the amount of space necessary to support a viable population of iguanas in a reserve system in the wild.



CRES Grants

The ***Armstrong McDonald Foundation*** *and the* ***Morris Animal Foundation*** *have made generous grants toward the preservation of endangered carnivore species through the CRES reproductive physiology division. Under the direction of Dr. Barbara Durrant, the study will explore carnivore oocyte growth, maturation, and fertilization. Assisting Dr. Durrant will be Dr. Digbo Bolamba, a postdoctoral fellow from the University of Laval, Quebec, Canada. CRES is pleased to recognize these foundations for their role in protecting endangered species from extinction.*

Estate Giving

You can help CRES and yourself in many different ways. By using planned giving techniques, you can significantly aid CRES in meeting its goals and secure many benefits for yourself in the process. Here are some choices that will provide a number of mutual advantages.

Brochures or other information regarding these giving opportunities are yours for the asking with absolutely no obligation. Just phone Patrick O'Reiley, the Society's planned giving director, at (619) 685-3215 and you'll receive a prompt response.

ESTATE PLANNED GIVING TECHNIQUES

LIFE INCOME PLANS

A charitable remainder trust is formidable sounding, perhaps, but simple in concept, and you can establish one. With this trust, you can irrevocably transfer cash, securities, or real estate and receive lifetime earnings checks. In addition, there are many tax advantages such as an immediate charitable gift income tax deduction, avoidance of capital gains taxes from the sale of appreciated property, and possible reduction or elimination of estate taxes. If you don't want to set up your own trust, you can utilize the Zoological Society's Pooled Income Fund, which provides essentially the same advantages as a personal trust but is as simple as opening a bank account.

LIFE INSURANCE

A very impressive future gift to CRES can be created through life insurance. Premiums paid are deductible if the Society owns the policy, which further reduces the already modest present cost of such a gift arrangement.

SECURITIES

Many types of securities, especially if highly appreciated, can make wonderful charitable gifts. You may deduct the full market value on the date of the gift, not just your basis, and thereby make a substantial immediate gift at a very low actual cost.

REAL ESTATE

Real property of many types can make great gifts with a low basis cost. And real estate can be transferred into charitable trusts to provide you lifetime income and tax advantages.

I.R.A.

You can make the Society the primary or contingent beneficiary of your I.R.A. and, thereby, possibly make a fine future gift to CRES with no actual additional cost above your planned I.R.A. contributions.

Hello, Pandas!

Shi Shi and Bai Yun, giant pandas from the People's Republic of China, will soon be on their way to the San Diego Zoo. The panda pair, which should be here this spring, will be sent to the Zoo as part of a long-term giant panda loan between the Zoological Society of San Diego and the China Wildlife Conservation Association.

The Zoological Society received the good news at a press conference held at the Zoo on Saturday, January 14, 1995, when U.S. Secretary of the Interior Bruce Babbitt announced that he had given the go-ahead for the U.S. Fish and Wildlife Service to issue a permit that will allow the Zoo to import the pandas from China. The landmark agreement focuses on a new international initiative on saving one of the world's most beloved animals from extinction.The San Diego Zoo panda loan will help raise funds for wild panda protection and habitat preservation.

The Zoological Society of San Diego will contribute $1 million each year for 12 years to wild panda habitat protection projects listed in China's National Conservation Plan for the Giant Panda and Its Habitat. The China panda plan calls for doubling the number of existing panda preserves, establishing protected "wildlife corridors" connecting the panda preserves, studies of pandas in the wild, and the study and breeding of pandas in zoos.

Since fewer than 1,000 giant pandas remain in China's dwindling bamboo forests, and only 100 pandas live in zoos and breeding centers, many of them in China, such research efforts are timely. In cooperation with China and with other zoos and wildlife organizations worldwide, scientists at CRES will lead studies of giant panda behavior and reproductive biology, both in zoos and in the wild.

Bai Yun (left) and Shi Shi (below left) are the two giant pandas to be sent to the San Diego Zoo from the Wolong Giant Panda Conservation Center in central China.

Photo by Nancy Czekala

ANIMAL ADOPTION APPLICATION

☐ **YES,** I want to adopt a bear as a gift for:

Name(s) ______________________________

Address ______________________________

City ____________________ State ____ Zip ________

Please sign the special card announcing my gift adoption as follows:

____

Name(s) ______________________________

Address ______________________________

City ____________________ State ____ Zip ________

Phone (day) ______________ (evening) ______________

Member Number ______________________________

☐ Also, please enter my own adoption for a bear at the special rate of $49 for one year.

Please make checks payable to the Zoological Society of San Diego and mail to:

The Zoological Society of San Diego
Adopt-An-Animal Program
P.O. Box 271
San Diego, CA 92112

Or, to charge your adoption by telephone, call (619) 557-3974 between 8:30 A.M. and 4 P.M., Monday through Friday. Orders must reach the San Diego Zoo by February 7 to ensure delivery by Valentine's Day.

☐ Please check here if you'd like more information about our Adopt-An-Animal Program.

(AVC5)

Adopt a Bear!

Give Bear Hugs for Valentine's Day!

If roses leave you cold and
candy isn't your style . . .
Forget the tame gifts and
give your special lovebird
A gift they'll be wild about!

It's easy and fun to adopt! Your gift will include:

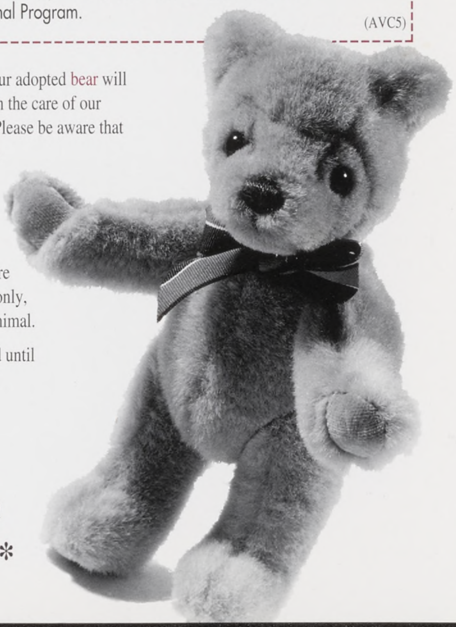
- **a cuddly plush 8" Gund® teddy bear**
- **an attractive adoption certificate**
- **a subscription to *CRES Report***
- **a special card to announce your gift adoption.**

And . . . the knowledge that your contribution will help the researchers at CRES continue their efforts to learn more about endangered animals and their habitats. The San Diego Zoo presently has on exhibit Alaskan Peninsula brown bears, as well as Manchurian brown, polar, sun, and spectacled bears, representing five of the eight species of bears found worldwide. Bears are omnivorous, eating both meat and plants. In the wild, bears enter a hibernation state in the winter. At the Zoo, this does not happen, however, in part due to our temperate climate. Bears are usually peaceful animals, normally avoiding conflict; however, they can be formidable if they feel threatened. They are persecuted in the wild by hunters for their meat, skin, and body parts (used in Asian folk medicine), as well as to protect domestic livestock. In some areas, they also suffer from loss of habitat due to human population growth.

Note: Naturally, your adopted bear will remain at the Zoo in the care of our professional staff. Please be aware that the lives of animals for adoption are subject to unavoidable changes. For that reason, adoptions are offered by species only, not by individual animal.

*Special price good until February 28, 1995.

Special Adoption Rate $49*



Bring Us Those Cans!

saving the earth & endangered animals
cans
for
critters

Spring has sprung and so has the 1995 Cans for Critters Spring Drive! Cans for Critters is an educational recycling program, with proceeds benefiting the Center for Reproduction of Endangered Species. "CRES Canners" save and redeem aluminum cans and other recyclables throughout the year in an effort to improve the present condition of our environment and the future of endangered wildlife.

This spring drive will get off to an exciting start as Cans for Critters teams up with Bank of America, which has generously underwritten a new Cans for Critters Introduction Video to be viewed by all program participants. There will be new prizes, new school incentives, and new graphics for a whole new look!

The drive officially begins on February 28 and runs through April 27, but many participants have already begun to redeem their aluminum cans for CRES. For more information on the Cans for Critters program, call Kim Jordan at (619) 685-3272. An information packet will be sent to you along with a special Zoo surprise! **Save those cans!**

Student winners of the Cans for Critters drive participate in a special awards assembly at the Zoo and meet animal friends.

C·R·E·S
REPORT
CENTER FOR REPRODUCTION OF ENDANGERED SPECIES

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SAN DIEGO ZOO · SAN DIEGO WILD ANIMAL PARK ·

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Post Office Box 551
San Diego, California 92112

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